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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS: Norihiko SAITO et al.
SERIAL NO: 10/715,458
FILING DATE: November 19, 2003
TITLE: DIAGNOSTIC APPARATUS AND DIAGNOSTIC METHOD
FUEL CELL
ART UNIT: 1745
EXAMINER: Tony CHUO

Mail Stop Appeal Brief - Patents
Commissioner for Patents
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REPLY BRIEF

SIR:

This is a brief in reply to the Examiner's Answer mailed December 18, 2006 in the above-identified application.

Fuglevand et al. (US 6,096,449) ("Fuglevand") is completely silent concerning application of a predetermined operation pattern to change an operational state of a fuel cell.

Generally, in the interpretation of Fuglevand, the Examiner erroneously equates parameters and operating conditions which are sensed and conditionally reacted to (Fuglevand's system), with a predetermined operation pattern that is applied to change an operational state (a feature of Appellant's claims).

For example, in the Examiner's Answer (hereafter, "EA"), the Examiner repeats the contention that Fuglevand's "predetermined performance parameters are equivalent to the predetermined operation patterns claimed by the applicant"

(EA, page 3, lines 9-10). This is error. Appealed claim 1 recites, *inter alia*, "a device control portion which controls the operation device such that the fuel cell is operated according to at least one predetermined operation pattern, the predetermined operation pattern to apply at least one predetermined operating condition to change an operational state of the fuel cell" Appealed independent 16 includes similar recitations. Thus, in Appellant's fuel cell, a predetermined operation pattern is applied to change an operational state. By contrast, Fuglevand's performance parameters are neither a predetermined operation pattern nor are they applied to change an operational state. Instead, Fuglevand's performance parameters are the fluctuating outputs of a fuel cell that are sensed or determined and then conditionally reacted to. See, e.g., Fuglevand at col. 2, lines 50-51: "the controller upon sensing a given voltage and current output terminates the supply of the fuel gas ..."; or at col. 11, lines 20-23: "determining, by way of the controller 122, whether the voltage and current output of the fuel cells 10 has a voltage and current output which is less than a predetermined amount" Note in particular that Fuglevand's performance parameters are fluctuating *outputs*, not inputs like the applied predetermined operation patterns of the claims on appeal.

By the Examiner's own admission, citing Fuglevand at col. 8, lines 9-15, Fuglevand's performance parameters are "determined by various means such as experiment, operation history or electric load" (EA, page 3, lines 7-9). Fuglevand goes on to say that the performance parameters thus determined may be "generally declining over a given time interval" (col. 8, lines 19-20) and "could be monitored, and ... would tend to suggest that a selected fuel cell is beginning to fail" (col 8, lines 25-27). Parameters of this kind do not reflect a predetermined operation pattern as recited in the claims on appeal. Indeed, the name itself – "performance parameters" – of Fuglevand's monitored outputs is telling. That is, "performance parameters" merely reflect system performance; they are a continually fluctuating record of system output. Parameters of this kind in no way correspond to predetermined operation patterns applied to cause a system to operate in a particular way, as recited in the claims on appeal.

In the “Response to Argument” portion of the EA, the Examiner argues that “the operational state of the fuel cell, i.e. on/off, is changed in response to the predetermined performance parameters of Fuglevand by determining whether to turn the fuel cell on or off.” But this only confirms the flawed interpretation of Fuglevand. Note in particular the Examiner's explicit acknowledgement that Fuglevand's fuel cell on/off operation is *conditional* -- i.e. based on monitoring performance parameters that are in a state of flux (e.g., “generally declining” or “tend[ing] to suggest”), it is “determin[ed] *whether* to turn the fuel cell on or off” (emphasis added). By contrast, in Appellant's claims, a predetermined operation pattern is *applied to change* an operational state of a fuel cell. This change is not conditioned on determining, sensing or monitoring fluctuating performance parameters as in Fuglevand.

Fuglevand is further completely silent concerning diagnosis of a state of a fuel cell based on a change in an operational state when the fuel cell is operated according a predetermined operation pattern.

Because Fuglevand does not disclose changing a state of a fuel cell to operate the fuel cell according a predetermined operating condition, it furthers follows that Fuglevand cannot disclose diagnosing the fuel cell based on its changed state, as further recited in the claims on appeal. Specifically, appealed claim 1 recites “a diagnostic portion which diagnoses the state of the fuel cell based on the change in the operational state of the fuel cell that is detected by the operational state detecting portion when the fuel cell is operated by the device control portion according to the at least one predetermined operation pattern,” and independent claim 16 recites similar language.

Nevertheless, the Examiner further contends that Fuglevand discloses “a fuel cell and a method of controlling the fuel cell that comprises a controller which operates the fuel cell according to a predetermined operation condition and diagnoses a state of the fuel cell by detecting a change in the operational state of the fuel cell and comparing the change in the operational state to a predetermined operation condition.”

(EA, page 3, lines 13-17). Fuglevand at col. 2, lines 41-45 is cited (EA, page 3, lines 17-18).

This is further error. Fuglevand at col. 2, lines 41-45 actually reads as follows: “A first aspect of the present invention is to provide a fuel cell which has a controller electrically coupled with the fuel cell and which shunts the electrical current between the anode and cathode of the fuel cell during predetermined operational conditions.” This passage reflects none of the features attributed to it by the Examiner. For instance, the passage does not disclose “operat[ing] the fuel cell according to a predetermined operation condition” as alleged by the Examiner. Instead, the passage is plainly describing a conditional reaction (i.e., shunting) to the sensing of an output operational condition, not the operation of a fuel cell according to a predetermined pattern.

The Examiner is unable to point out the claimed diagnostic feature in Fuglevand. The Examiner does make various references to a “controller that diagnoses” in Fuglevand (EA, paragraph bridging pages 3 and 4). However, none of these references describes a controller that makes a diagnosis based on an applied predetermined operation pattern that changes a fuel cell operational state. Instead, according to the Examiner’s own analysis, the diagnosis is based on, for example, “sensing a given output voltage, output current, or an open state voltage” (EA, page 3, lines 18-20) or “deterioration due to a change in the output voltage” (EA, page 4, lines 2-3). But nowhere in Fuglevand are these ever described as the result of applying a predetermined operation pattern to change an operational state. Instead, the output voltage, output current, or open state voltage are merely Fuglevand’s performance parameters, which as discussed previously are fluctuating values that are sensed or monitored to record system performance, not applied to change an operational state.

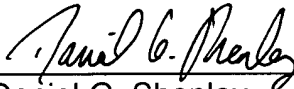
Conclusion

In view of the above, it is abundantly clear that the Examiner erred in finally rejecting claims 1-19. It is therefore respectfully requested that the Board reverse the Examiner and allow claims 1-19.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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